HONOLULU
LA JOLLA
MONTEREY
TIBURON

SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - JULY 1982
TABLE OF CONTENTS AND RESEARCH HIGHLIGHTS

	Page
PUBLICATIONS	1
HONOLULU LABORATORY	4
Honolulu Laboratory Scientist Attends Marine Mining Conference	6
Albacore Landings Sampled	7
LA JOLLA LABORATORY	9
Cruise Plankton Samples Analyzed	11
Anchovy Fishery Workshop Held at SWFC	16
New Study on Genetic Variability in Tuna Stocks Initiated	18
Billfish Tagging Awards Given	20
TIBURON LABORATORY	29
Markets for Various Seafood Products Tested	29
FISHERIES INFORMATION SYSTEMS AND AUTOMATIC DATA PROCESSING	32
CALFIN and PACFIN Update--Regional and Coastwide Data Bases Being Developed	32
MISCELLANEOUS	35
Honors, Awards, Seminars, Public Affairs, Visitors Meetings and Travel, and Personnel	35

NOAA/NMFS

SOUTHWEST FISHERIES CENTER

CENTER ADMINISTRATION — La Jolla, California

Center Director ..... *Izadore Barrett*
Deputy Director ..... *John F. Carr*
Planning Officer ..... *David J. Mackett*
Data Systems Manager ..... *Fred J. Kellenberger*
Executive Officer ..... *Benjamin F. Remington*

LABORATORIES & DIVISIONS

Coastal Fisheries Research Division, Chief ..... *Reuben Lasker*
La Jolla, California
Honolulu Laboratory, Director ..... *Richard S. Shomura*
Honolulu, Hawaii
Oceanic Fisheries Research Division, Chief ..... *Gary T. Sakagawa*
La Jolla, California
Pacific Environmental Group, Chief ..... *Gunter R. Seckel*
Monterey, California
Tiburon Laboratory, Director ..... *Norman J. Abramson*
Tiburon, California

The Monthly Report of the Southwest Fisheries Center is compiled by the Technical Writing/Editing Group at La Jolla from material submitted by the Center's staff. To change the delivery address of the Monthly Report, or to cancel your subscription, please notify Lillian Vlymen, Editor, at P.O. Box 271, La Jolla, CA 92038.

SOUTHWEST FISHERIES CENTER
LA JOLLA, CALIFORNIA

HONOLULU LABORATORY
LA JOLLA LABORATORY
TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

MONTHLY REPORT - JULY 1982

STATUS OF PUBLICATIONS

Published

Hobson, E.S. 1982. The structure of fish communities on warm temperate and tropical reefs. pp. 160-166. In: G.R. Huntsman, W.R. Nicholson, and W.W. Fox, Jr., The biological bases for reef fishery management. NOAA Technical Memorandum, NMFS, NOAA-TM-NMFS-SEFC-80.

There are many more species on coral reefs than in kelp forests, although there does not appear to be many more individuals. The more diverse array of species in the coral reef community expresses a more complex system of trophic relationships. This, in turn, stems from the much higher proportion of specialized feeding types that can exist in the coral reef environment because it remains relatively unchanged during the lives of most inhabitants. A contrasting condition exists in the temperate kelp forest, where frequent and profound transformations of the habitat related to changing life stages of the predominating macroalgae preclude narrowly defined, specialized feeding modes.

Jemison, Howard A. III, Andrew E. Dizon, and Michael M. Walker. 1982. An automatic feeder for liquids and wet or dry solids. Behav. Res. Methods Instrum, 14:54-55.

An inexpensive and simple, remote-control conveyor-belt feeder is described. The feeder handles liquids and wet or dry solids.

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

Administrative Reports

Honolulu Laboratory

Barnett, W.B. 1982. Seamount trawl fishery, foreign vessel observer report, Takachiho Maru (May 3-17, 1982). SWFC Admin. Rep. H-82-12.

Nishimura, H.S. 1982. Background information on the National Marine Fisheries Service Honolulu Laboratory Library. SWFC Admin. Rep. H-82-13.

Uchida, R.N., D.T. Tagami, and J.H. Uchiyama. 1982. Results of bottom fish research in the Northwestern Hawaiian Islands. SWFC Admin. Rep. H-82-10.

Uchida, R.N. 1982. Review of fish handling techniques in Hawaii. SWFC Admin. Rep. H-82-11.

[U.S.] National Marine Fisheries Service. 1982. Fishery data needs of the National Marine Fisheries Service in the Hawaiian Archipelago. SWFC Admin. Rep. H-82-9.

[U.S.] National Marine Fisheries Service. 1982. Preliminary results of a survey of wholesale fish dealers in Hawaii. SWFC Admin. Rep. H-82-14.

Translations

Ivo, Carlos Tassito Correa. 1973. Study on the fishery biology of pargo, Lutjanus purpureus: Poey, in northeastern Brazil--Data for 1972 (Estudo sobre a biologia da pesca do pargo, Lutjanus purpureus: Poey, no nordeste Brasileiro--dados de 1972). Arq. Cien. Mar 13(1):39-43, June 1973. (Engl. transl. by Wilvan G. Van Campen, 1982), 7 p., Transl. No. 64; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Menezes, Mariana Ferreira de, and Tereza Cristina Vasconcelos Gesteira. 1974. Age and growth of the pargo, Lutjanus purpureus: Poey, of the north and northeast of Brazil (Idade e crescimento do pargo, Lutjanus purpureus: Poey, do norte e nordeste do Brasil). Arq. Cien. Mar 14(2):81-85, December 1974. (Engl. transl. by Wilvan G. Van Campen, 1982, 8 p., Transl. No. 65; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA Honolulu, HI 96812.)

Ivo, Carlos Tassito Correa, and Tereza Cristina Vasconcelos Gesteira. 1974. Preliminary estimation of the measurements of mortality of the pargo, Lutjanus purpureus: Poey, in northern and northeastern Brazil (Estimacao preliminar das medidas de

mortalidade do pargo, Lutjanus purpureus: Poey, no norte e nordeste Brasileiros). Arq. Cien. Mar 14(2):123-127, December 1974. (Engl. transl. by Wilvan G. Van Campen, 1982, 7 p., Transl. No. 66; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Ivo, Carlos Tassito Correa. 1975. Study of the fishery biology of the pargo, Lutjanus purpureus: Poey, in northern and northeastern Brazil--Data of 1974 (Estudo sobre a biologia da pesca do pargo, Lutjanus purpureus: Poey no norte e nordeste Brasileiros--dados de 1974). Arq. Cien. Mar 15(2):119-123, December 1975. (Engl. transl. by Wilvan G. Van Campen, 1982, 7 p., Transl. No. 67; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

La Jolla Laboratory

Dailey, M.D. and K.A. Otto. 1982. Parasites as biological indicators of the distributions and diets of marine mammals common to the eastern Pacific. SWFC Admin. Rep. LJ-82-13C.

Majors, A.P., Coan, A.L., Bartoo, N. and F. Miller. 1982. Summary of 1981 north Pacific albacore fishery data. SWFC Admin. Rep. LJ-82-12.

Perrin, W., Yablokov, and V. Cass. 1982. Preliminary report on the use of non-metrical skull characters to discriminate populations of pelagic dolphins. SWFC Admin. Rep. LJ-82-14.

Schnell, G.D., Douglas, M.E., and D.J. Hough. 1982. Geographic variations in morphology of spotted and spinner dolphins (Stenella attenuata and S. longirostris) from the eastern tropical Pacific. SWFC Admin. Rep. LJ-82-15C.

Approved by Center Director

Echeverria, T. and K. Fourre. A new morphological feature to differentiate the blue rockfish (Sebastes mystinus) from the black rockfish (Sebastes melanops). For submission to California Department of Fish and Game Quarterly.

Matsumoto, Walter M. The status of the squid fisheries in the United States of America. Proceedings of the 3rd Session of the Standing Committee on Resources Research and Development, Sydney, Australia, 28 April to 4 May 1982.

Skillman, Robert A. A note on microcomputers and fisheries. Proceedings of the 3rd Session of the Standing Committee on Resources Research and Development, Sydney, Australia, 28 April to 4 May 1982.

HONOLULU LABORATORY

INSULAR RESOURCES INVESTIGATION

Second Mariana Resource Assessment Cruise Completed

Dr. Jeffrey J. Polovina, Leader of the Resource Assessment Investigation of the Mariana Archipelago (RAIOMA), reports that the NOAA research ship Townsend Cromwell completed the second of three 6-week fisheries assessment cruises in the Mariana Archipelago. Chief Scientist during the cruise was Dr. Stephen Ralston and assisting him were research assistants Alan R. Everson and Robert L. Humphreys, Jr.

A total of nine islands/banks was visited during the latest cruise including stops at Guam, Farallon de Medinilla, Guguan, Alamagan, Pagan, and Agrihan Islands and Esmeralda, Arakane, and 38-Fathom Banks. Catches of bottom fish, including fishes of the deepwater snapper-grouper community, were best at Pagan and the other more northerly islands (Alamagan, Guguan, and Agrihan), all of which are volcanic and composed of basalt. Catch rates around Guam were poor, amounting to only 15% of those farther north. Overall some 30 species of bottom fish were landed in 33-days of fishing, with an overall catch rate of 3.5 fish landed per line-hour of fishing. Catches were composed largely of snappers including gindai (50% of the total), yellow-tailed kalekale (18%), yellow-eyed opakapaka (7%), ehu (4%), and pink opakapaka (3%). Another 5% of the catch was black ulua.

Catches of deepwater shrimp, composed mainly of the highly desirable Heterocarpus laevigatus and H. longirostris species, were also very good. Four strings of five traps each were set overnight on 24 occasions and caught on the average 1.6 kg of shrimp per trap each day. Yields were best at Arakane Reef and Guguan Island which produced average daily catches as high as 5.73 and 5.17 kg per trap-night. As with bottom fish, the shrimp resources around Guam appeared to be substantially less than elsewhere.

In addition to these two resource groups, sampling was undertaken for mackerel scad or akule. Over 1,600 akule were handlined during the cruise, mainly from Agrihan, Alamagan, Farallon de Medinilla, and Arakane Reef. Of these, 350 were tagged and released at Agrihan and 150 at Arakane Reef. Ralston reported that akule resources in the Marianas appeared to be substantial and could provide live bait for tuna fishing operations as well as excellent food for human consumption.

In addition to the stock assessments for bottom fish, shrimp, and akule, the field party on the Cromwell performed bathymetric surveys of some of the more poorly known fishing banks in the region, including Rota Bank and Farallon de Medinilla, and engaged in cooperative investigations with University of Guam researchers on zooplankton and mesopelagic fishes and shrimps. An observer for the Commonwealth of the Northern Mariana Islands

also participated in the latter half of the trip. The Cromwell is currently on the third and final biological cruise in the Marianas this year and should return to Honolulu in September.

Guam RAIOMA Field Station Operating Smoothly

Robert B. Moffitt, Fishery Biologist, reports that the Resource Assessment Investigation of the Mariana Archipelago (RAIOMA) field station in Guam is operating smoothly. Moffitt has been processing and sorting specimens collected on the NOAA research vessel Townsend Cromwell cruises 82-02 and 82-03. A list of corals collected (largely in the gill net) is being prepared by Richard Randall of the University of Guam Marine Laboratory. This list will include many new depth and geographical records for corals in the area. Moffitt is continuing to measure and sex pandalid shrimps collected on these cruises. This information will be used to identify year-class modes as well as to look into the hypothesized proandrous hermaphroditism in these shrimps.

Moffitt has also attended meetings of the Guam Fishery Advisory Council, the Sea Grant Advisory Program, and the Fisherman's Co-op. He has also met with many of the local fishermen on a one-to-one basis.

Reports Prepared for Presentation at Scientific Meeting

Richard N. Uchida, Leader of the Insular Ecosystem Study, completed a report, "Review of fish handling techniques in Hawaii," and together with research assistant Darryl T. Tagami and James H. Uchiyama, Fishery Biologist, another report, "Results of bottom fish research in the Northwestern Hawaiian Islands." The reports will be presented by Dr. Robert A. Skillman at the 14th Regional Technical Meeting on Fisheries, South Pacific Commission, at Noumea, New Caledonia.

In the report on bottom fishes in the Northwestern Hawaiian Islands (NWHI), the results of exploratory handline fishing at 25 banks were analyzed. Among the more productive banks in the NWHI was Nero Seamount, where 18.8 line-h of fishing produced 5.39 fish/line-h and ehu, Etelis carbunculus, predominated. Other banks with excellent fishing were Bank No. 9, a submerged pinnacle located at lat. 27°00'N, long. 175°35'W, where the catch rate reached 3.608 fish/line-h and ehu, hapuupuu, Epinephelus quernus, and kahala, Seriola dumerili, dominated the catch, and at Pearl and Hermes Reef where the catch rate was 3.252 fish/line-h in 234.93 line-h of fishing. The catch at Pearl and Hermes was composed predominantly of ehu, hapuupuu, kahala, butaguchi, Pseudocaranx dentex, kalekale, Pristipomoides sieboldii, onaga, Etelis coruscan, and nohu, Pontinus macrocephalus. Fishing was also good at Midway, Maro Reef, French Frigate Shoals, and Bank No. 8, located at lat. 26°17'N, long. 174°34'W. Analysis of the bottom fish data is continuing.

Honolulu Laboratory Scientist Attends Marine Mining Conference

Richard Uchida, Leader of the Insular Ecosystem Study, reports that he attended a Marine Mining Conference in Hilo, Hawaii, which brought together experts in all aspects of the industry for the exchange of current information on the political, economic, legal, environmental, engineering, and scientific developments of the past decade.

Uchida noted that the session on environmental impact assessment was of particular interest. The conclusions drawn by most panel scientists were that marine mining of manganese nodules can be accomplished without permanent adverse effect on the marine environment. Wastes (tailings) from the mining operations would have to be managed with great care, and these problems would have to be resolved in the time remaining before marine mining can begin (January 1, 1988). Panel members indicated that intensive studies should be continued on settling velocity spectrum of resuspended particulates, on responses of marine organisms to chemical and physical disturbances resulting from marine mining, plume characteristics and behavior, and mechanisms for particle removal at the mining site.

Northwestern Hawaiian Islands (NWHI) Research Activities Continue

Richard Uchida, Leader of the Insular Ecosystem Study, summarized Honolulu Laboratory (HL) research on spiny lobster, bottom fish, seamount groundfish and miscellaneous species such as caridean shrimp and kona crab. The summaries were submitted to Dr. Robert Shallenberger of the Department of the Interior, U.S. Fish and Wildlife Service, who is coordinating the production of a film of the cooperative research on the living terrestrial and marine resources of the NWHI.

Research assistant James H. Prescott assisted research assistant J. Uchiyama with the analysis of trolling data collected during cruises to the NWHI. Prescott edited the data for error entries and wrote a program to sum the effort and catch and calculate the catch per line hour, by banks, during direct trolling operations.

Research assistant Michael P. Seki began analysis of spew samples from ehu caught in the NWHI.

Reproductive Biology of Kahala Studied

Research assistant Bert S. Kikkawa reported that analysis of monthly fluctuations in the indices of gonad development (gonad weight per body weight times 100 and gonad weight per fork length) indicated that kahala exhibit year-round spawning with peaks occurring in March-April. Kikkawa also found

ovary weight to be a better predictor of fecundity than either body weight or fish size. The regression expressing the relationship between fecundity and ovary weight is:

$$F = -0.236 + 0.0036X$$

where F = fecundity x 10^6

and X = ovary weight in grams.

The smallest ripe female was 65 cm in fork length (FL). Sex ratio analysis showed no significant deviation from 1 to 1 among the smaller kahala; however, for fish over 120 cm FL 95% of the sample were females.

FISHERY MANAGEMENT RESEARCH PROGRAM

Albacore Landings Sampled

Dr. Skillman, Leader of the Fishery Management Research Program, reports that the Honolulu Laboratory is again cooperating with the Oceanic Resources Division of the La Jolla Laboratory, in monitoring the central North Pacific albacore troll fishery. Research assistant Bernard M. Ito, who is heading the sampling project, reports that 49 albacore vessels landed catches at Hawaiian Tuna Packers this season. Total catch of albacore was 1,030.96 short tons (ST) and 6.935 ST of yellowfin tuna. Hawaii-based boats accounted for 205.045 ST. Fishing was considered very poor and up to 10 vessels (of 60-70 fishing) returned to the west coast. The fishing grounds ranged from lat. 31° to 47°, long. 140° to 176°. Research assistants Richard A. Bierma, Anne M. Houtman, Walter N. Ikehara, and Henry M. Kishinami worked with Ito to collect size-frequency and logbook data.

Billfish Data Summarized

Samuel G. Pooley, Industry Economist, and Research assistants James C. Cooper and Randy F. Stark, and Honolulu Laboratory Junior Fellow Daniel R. Locey prepared summaries of billfish data from Hawaii Division of Aquatic Resources (HDAR) catch reports and confidential records supplied by eight wholesale fish dealers and brokers. The summaries are being provided to the Western Pacific Fishery Regional Management Council (WPRFMC) which is preparing an amendment to the Billfish Fishery Management Plan. Data show significant, but statistically uncertain, increases in billfish landings over the past 6 years. Measures of fishing effort are currently unavailable.

Similar summaries on bottom fish and groundfish catches in Hawaii are being provided to the WPRFMC in support of their bottom fish programmatic assessment.

Various Recreational Fishery Data Sets Being Compiled

Thomas S. Hida, Fishery Biologist, reported a variety of activities compiling data sets on the Hawaiian recreational fishery. Hida contacted 20 fishing clubs on Oahu and has received a list of members and vessels from 8 of the clubs. He obtained the cooperation of the Hawaii Division of Aquatic Resources (HDAR) to have their biologists stationed on the neighbor islands collect similar data.

With the cooperation of the Hawaii Department of Transportation (HDT) research assistants Walter Ikehara and Richard Bierma are extracting boat names from the registration forms maintained by HDT. When completed this data set will provide a list of boat names together with their identification numbers and a means of cross-checking boat names with identification numbers, which will allow the easy classification of boats. Hida and research assistant Bernard Ito also began work compiling a list of documented vessels in Hawaii through the cooperation of the Coast Guard.

Research assistant Graydon A. Keala extracted and coded recreational fishing data from the 1981 issues of Hawaii Fishing News.

Hawaii Landings of Skipjack Tuna Below Long Term Average

The July 1982 Hawaii landings of skipjack tuna were estimated at 327 metric tons (MT), which is 256 MT below the July 1981 landings and 414 MT below the 1964-79 long-term average for July. The cumulative landings from January through July were estimated at 1,110 MT which is 296 MT below the 1981 landings for the same period and 1,392 MT below the 1964-79 long-term average for the same period (Figure 1).

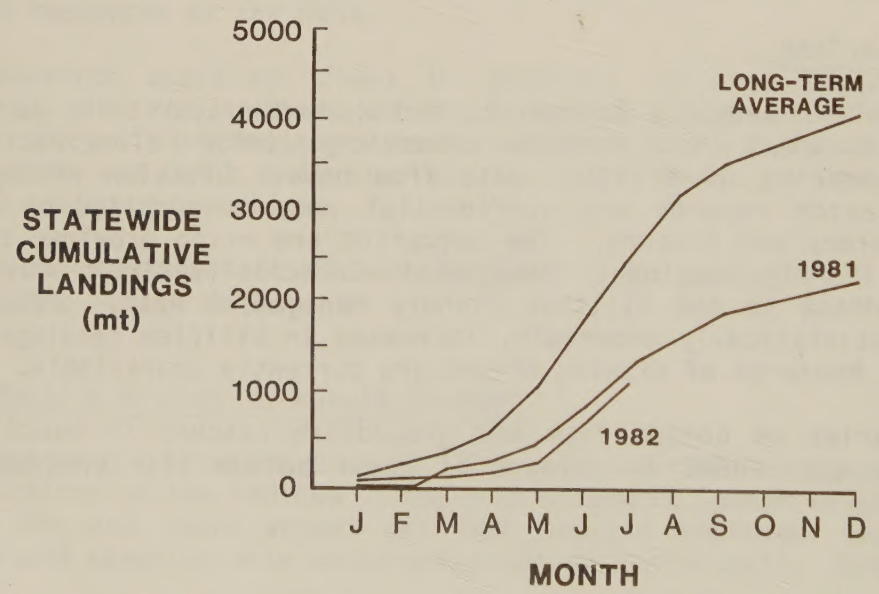


Figure 1.--Cumulative landings in the Hawaiian skipjack tuna fishery.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

SURVEY SYSTEMS DEVELOPMENT AND EVALUATION

New Portable Microcomputer System Under Development for Field Quality Control of Data

Fishery biologist Bill Flerx has developed a new system for collecting, processing, checking, and formatting data at sea. The new development, to be tried on the NOAA research vessels David Starr Jordan this fall, and Townsend Cromwell next winter, will use a pocket calculator to create card image records on cassette tape for direct transmission to the CalCOFI data base management system, without the intervention or delay of key punching or other data entry techniques. This new product, released by Radio Shack in June 1982, will facilitate the direct entry and field checking at sea of plankton tow data from 1,000 vertical tows and 200 oblique tows each cruise. Other applications of the system are planned for calibration of flow meters, plankton voluming and sorting, and tow quality evaluation. Computer specialist Rich Charter, supervisory fishery biologist Jim Thrailkill, and fishery biologist Dr. Paul Smith are directing this development. Bill Flerx has recently completed a course in programming BASIC.

Center-Scientists Teach Course in Mexico in Ecology of Marine Fish Larvae

NOAA Corps Officer Dr. Roger Hewitt and Dr. Paul E. Smith, Fishery Biologist, completed teaching a special course on the ecology of marine fish larvae at CICESE (Centro de Investigacion Cientifica y Educacion Superior de Ensenada) Graduate School of Science in Ensenada, Baja California, Mexico. The course was completed for credit by four graduate students and audited by six advanced graduate students and working professionals in marine science in the Ensenada area. The course was based on the recent book, Marine Fish Larvae, edited by Dr. Reuben Lasker, Chief of the Coastal Fisheries Resources Division, and which contains contributions by fishery biologists Dr. Geoff Moser, Dr. John Hunter, Dr. Paul Smith and Lasker.

CalCOFI Data Access Implemented with DATATRIEVE

In the most recent advance in CalCOFI, data base management, simultaneous access to biological and oceanographic parameters in CalCOFI data files may soon be made possible with the DATATRIEVE data management system on the VAX

11/780 computer. Oceanographer Larry Eber has completed software necessary to copy the oceanographic data from magnetic tape into VAX disk files in a format prescribed by CalCOFI data manager Rich Charter.

Charter has created data definition files for both biological and oceanographic record formats in order to utilize the full capability of the DATATRIEVE system. Using DATATRIEVE it is possible to match up the biological and oceanographic data for all of the historical CalCOFI files.

COASTAL EASTERN PACIFIC: POPULATION BIOLOGY OF FISHES

Spawning Characteristics of Northern Anchovy from Geographically Separated Areas Studied

Dr. John Hunter, Investigation Leader, reports that samples of northern anchovy from Monterey Bay, California, collected during March 1979 and from San Francisco, California, and Monterey, collected in January 1982 indicate that fish from this area have reproductive traits that differ from those of anchovy from south of Point Conception, California.

In March 1979, the ovaries of 72% of the females from Monterey were atretic (oocytes being resorbed) and in January 1982 57% of the ovaries were atretic (Table 1). Thus in March 1979 and in late January 1982, the spawning season for anchovy from the Monterey area was ending, whereas south of Point Conception females with atretic ovaries were rare (14% March-April 1979; 3% January-March 1982) and spawning continued at a high level.

Table 1. Atretic condition of the ovaries of female anchovy from north of Point Conception (San Francisco-Monterey area) south of Point Conception (Southern California Bight and Baja California) in 1982.

Region	Number of females	Percentage of females[1]			
		No artesia of yolked eggs	Yolked eggs being resorbed		No. yolked eggs remain; unyolked eggs being resorbed
			Less than 50% of yolked eggs affected	50% or more or yolked eggs affected	
North of Conception (January)	67	43.	28.	9.0	19.
South of Conception (January-March)	1621	96.7	2.8	0.1	0.4

[1] mature females

On the average, females from the Monterey area are larger than those from the south and may be older when they attain first sexual maturity. In addition, the batch fecundity of females from Monterey in 1982 averaged 384 eggs/g female weight (N=5; SD-111) and was substantially below the fecundity of the fish south of Point Conception (617 eggs/g; SD-145; N=104), indicating that batch fecundity had declined in the northern group near the end of the spawning season. Thus anchovy in the Monterey area may begin spawning earlier than fish to the south, perhaps reaching their maximum reproductive rate in December rather than in February or March or April as do the fish to the south. It is possible that a small enclave of anchovy from the northern subpopulation or a separate subpopulation exist in the San Francisco-Monterey area and this small group is often hidden by immigration of fish from the far more abundant central subpopulation to the south.

Cruise Plankton Samples Analyzed

This month fishery biologist Dr. Angeles Alvariño determined that high numbers of anchovy eggs and larvae are found in neritic waters of California characterized by dominance of the Chaetognatha Sagitta euneritica (indicator of neritic waters in the North American Pacific), and by high specific diversity of planktonic organisms, particularly copepods. Neritic locations with low specific diversity show an absence of anchovy eggs and larvae.

Alvariño's conclusions are based on her ongoing analysis of plankton samples from the CALVET collections obtained by the NOAA research vessel, David Starr Jordan, during cruise 8104. Samples from the area of the "plume," as identified from the satellite image, were examined, as were samples from locations edging the plume, locations with no anchovy eggs or larvae, locations with high numbers of anchovy eggs and larvae, and locations with lower number of eggs than of larvae.

Specimens of planktonic organisms were identified to species level, and the number of individuals in the sample were counted. Alvariño determined numbers of male and female specimens, the stage of maturity for each sample, and the number of larval-stage individuals. Females with egg bags and females with spermatophores attached were also identified.

Specimens of the following groups were found in the sample: Medusae, Siphonophorae, Ctenophora, Cladocera, Ostracoda, Copepoda, Amphipoda, Euphausiidae, Pteropoda, Heteropoda, Polychaeta, Chaetognatha, Tunicates, Foraminifera, Radiollaria, and Decopod larvae and the larvae of other invertebrates.

A new Prayidae Siphonophore was also found in the CALVET collections. The specimen was complete, with nectophores, bracts, gonophores, gastrozoids, siphons, tentacles, and tentilla; it was sorted out to be studied and described. Young specimens of medusae showing characteristics quite different from the corresponding adults were also found. Specimens are being sorted out to study the morphological changes in the life history of the various species.

BERING SEA RESEARCH CRUISE

Work continued this month on analysis of pollock larvae and larval prey collected during the May-June research cruise in the Bering Sea. Larvae and prey were collected for a study designed to determine whether starvation is a significant cause of larval pollock mortality. The 3-week cruise was conducted aboard the University of Alaska research vessel Alpha Helix.

Dr. Reuben Lasker, Chief of the Coastal Fisheries Resources Division, visits a Tanner crab processor in the Pribilof Islands.

The research cruise team: (L to R) Michael Creek, Biological Technician, University of Alaska (UA); David Boisseau, Oceanographic Technician, UA; Liz Clarke, Graduate student, SIO; Judy McDonald, Biological Technician, UA; Gail Theilacker, Fishery Biologist, La Jolla, Laboratory; Dr. Reuben Lasker, Chief of the Coastal Fisheries Resources Division, La Jolla, Laboratory.

Metabolic Estimates Made for Northern Anchovy Larvae

As part of an ongoing study on the growth and survival of larval anchovy, fishery biologist Gail Theilacker continued analysis of data on anchovy metabolic rates. The objective of the study is to determine how variations in prey type and density affect the rates of anchovy feeding, consumption, evacuation, and growth. Using this information, Theilacker will estimate gross growth efficiencies by comparing "output" (changes in fish weight) to "input" (food weight). Energy exchange in anchovy will also be estimated indirectly by calculating food requirements needed to fuel the anchovy's observed metabolic rate and activity level.

This month Theilacker completed an analysis of anchovy metabolic rates for larvae ranging in age from first-feeding (three days after hatching) to 25 days of age. She used the Winkler technique to estimate oxygen consumption at 17°C during 18-23h experimental periods with a 12h light-dark cycle. The respiration vessels were attached to a large, slowly rotating wheel. Young larvae, 0.02 to 0.14mg dry wt were tested in 40 ml vessels in groups of 10-50, while larvae older than 10 days (larger than 0.14mg) were tested individually in 60-150 ml vessels. All fish tested had empty guts.

To express metabolism (Q) as a function of dry weight, Theilacker fit a nonlinear regression to the data (see parameters for Model I in Table 1). The data points were weighted by their sample size (10-50). The fit of the model was unsatisfactory for the whole size range, presumably because each data point for the young larvae (n=72) was a group mean, and thus the model was significantly weighted toward the young larvae causing it to overestimate oxygen consumption for the fewer, large larvae (n=17). Because the experimental technique differed, i.e., either measuring respiration of grouped, young larvae or individual, older larvae, Theilacker felt it would be more appropriate to fit two separate curves. Both curves gave a good fit to the data (parameters for Model II in Table 1): the slope for the older larvae (b=0.697) was less than the slope for the younger larvae (b=0.834).

TABLE 1. Parameters for measuring larval anchovy metabolism

Larval Anchovy Metabolism $Q = aw^b$

Model	N	Size group (mg dry wt) w	Parameters a (SE)	b (SE)
I	89	.02 - 2.70	3.844 ±.100[1]	.858 ±.029[1]
II	72	.02 - 0.14	2.879 ±.344	.834 ±.057
II	17	.14 - 2.70	4.269 ±.325	.697 ±.107

[1](The sum of the residuals in Model I does not equal zero, thus the program calculation of SE's is biased.)

The caloric equivalent of metabolism for anchovy larvae ranging in age from first feeding to 25 days of age can be determined using Model II and by converting the oxygen uptake to calories, using an oxycalorific equivalent of 0.00463 cal/ul O_2. For example, the daily metabolic cost is equivalent to 0.013 calories for first-feeding larvae weighing 0.0211 mg (from Model II. μl O_2/hr = 2.897 (0.0211 mg)$^{.834}$ = 0.116 x 24 hr = 2.78 μl O_2/day x .00463 cal/μ 1^2O_2 = 0.013 cal/day).

An alternate approach for estimating the caloric equivalent of metabolism is to starve larvae of known size/weight, determine the size-specific weight loss, and convert the loss of weight to calories. This approach is preferred because it eliminates the need to restrict larval swimming activity in the confines of a respiration vessel. Presumably the weight loss in caloric units would equal the loss due to metabolic costs.

Using this approach, Theilacker starved first-feeding anchovy larvae that were maintained in large, 100 liter rearing tanks at 15.5°C. The larvae lost an average of 10% of their body weight per day for 3-days. (For northern anchovy, time to irreversible starvation - when the larvae have no body reserves and will not eat when offered food - from the onset of feeding is 3-4 days, and the number of days to irreversible starvation increases with age). Larvae that weighed an average of 0.0211 mg at first-feeding (age 3 days) weighed an average of 0.0148 mg on day 6. The weight loss, 0.0063mg, x a larval caloric equivalent of 5.386 calories/mg = 0.0338 calories, or a metabolic demand of 0.011 cal/day. This value, determined at a slightly lower temperature, corresponds well with the value obtained using respiration measurements (0.013 cal/day).

ECOLOGY AND TAXONOMY OF FISHES OF THE CALIFORNIA CURRENT

Preparation of Papers for Ahlstrom Memorial Symposium Continues

The staff has been working on papers to be presented at the symposium entitled, "Ontogeny and Systematics of Fishes," which will be held at the Southwest Fisheries Center in La Jolla, California, August 15-18, 1983.

Dr. Geoffrey Moser, Program Leader, is preparing sections of papers on argentinoids, stomiatoids, myctophids, and flatfishes. Fishery biologist Barbara Sumida-MacCall is also working on the flatfish paper and contributing to a poster session on illustrations of early life history stages. Biological laboratory technician Elaine Sandknop is contributing to two poster sessions, one on preparation of materials for early life history descriptions and one on egg identification. Biological laboratory technician Betsy Stevens is collaborating with Ann Matarese (Northwest and Alaska Fisheries Center) and Bill Watson (Marine Ecological Consultants) on a paper dealing with blennioid fishes. Matarese visited the laboratory during June to work with Stevens on the blennioid paper and with Sandknop on the egg identification poster.

Early Life History Descriptions of Coastal Fishes

Biological technician David Ambrose has been preparing a manuscript on the early life history stages of two species of cusk eels, Ophidion scrippsi and Chilara taylori. The specimens used in the study came from growth series reared in the aquarium by other members of the task. Progress continues on the manuscript describing larvae of California croakers, with fishery biologist Barbara Sumida-MacCall completing the illustrations of white sea bass larvae.

Curation and Archiving of CalCOFI Collection

Biological technician Victor Gorospe has made excellent progress curating the historic CalCOFI fish egg and larvae collection. As part of this effort he has been sampling the pH of the fluid preservative in each of the sample boxes. The relatively low pH values encountered, typically varying between 4.0 and 5.0, appear to have no detrimental effect on the specimens, which are generally in excellent condition. The pH values are adjusted towards neutrality by the addition of fresh preservative.

Comparison of CalCOFI larvae with those of the "Gill Collection" (an historical collection from the former NMFS laboratory in Brunswick, Georgia, which is now in the care of the CalCOFI group) indicates that basic preservative solutions are far more damaging to larval fish specimens. All fish larvae in the "Gill Collection" were transparent, bleached, and partly decomposed when they arrived, and the pH of the preservative is uniformly above 8.0.

Josephine Hoang, Upward Bound Student, worked in the laboratory from July 12 through July 30 curating special collections in the Reference Collection. She did an excellent job and learned techniques for handling early life history material.

COMMERICAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Anchovy Biomass Estimate Presented to Fishery Council's Scientific and Statistical Committee

An estimate of the northern anchovy spawning biomass for the 1982-1983 fishing season was presented to the Scientific and Statistical Committee of the Pacific Fisheries Management Council by Susan Picquelle, Statistician, Dr. Roger Hewitt, NOAA Corp Officer, and Alec MacCall, California Department of Fish and Game biologist at the La Jolla Laboratory. Picquelle described the egg production method and the estimation procedures for the individual

parameters in the model. She compared this year's parameter estimates to past years' estimates and described how they had been improved and also how they might be further improved.

Picquelle continued working on Administrative Report LJ-82-16, "The northern anchovy biomass for the 1982-83 California fishing season," by Picquelle and Hewitt. She made some minor adjustments to the estimates and revised the variance formula for the estimate of batch fecundity. The manuscript is intended for publication in CalCOFI Reports.

Anchovy Fishery Workshop Held at Southwest Fisheries Center

A workshop on the anchovy fisheries was held on July 20, 1982, at the Southwest Fisheries Center. Representatives from the National Marine Fisheries Service; California Department of Fish and Game; Living Marine Resources, Inc.; and Pesquera Zapata, a major user of the resource in Ensenada attended the meeting. The United States and Mexican fisheries were described and compared to recent biomass estimates and trawl surveys. The recent combined annual landings of about 300,000 tons are a large fraction of the 1982 egg production biomass estimate of 386,000 tons.

The increased catch during the latter half of the 1970's coincides with a decreased biomass and an increase in annual total mortality rate from 0.83 during 1967-74 to 1.49 during 1979-82. If the increased total mortality was due to fishing mortality increasing from 0.06 to 0.6 and if mean recruitment remained constant then a simple population model predicts that catch would increase 4.2 fold and that biomass would decrease to 0.53 of its former level. These changes are sufficiently close to the observed to conclude that the fishery is now having a significant impact on the resource.

One possible cause of a high catch relative to the biomass estimate is inclusion of fish from the southern subpopulation in the catch but not in the biomass estimate. Representatives of Pesquera Zapata noted that most fishing is near Ensenada, well north of the preserved subpopulation boundary, and that southern subpopulation fish would be recognizable by their low oil yield. It was concluded that all fishing probably is on fish of the central subpopulation but it was noted that fish of the same age are consistently smaller in the southern portion of the central subpoulation. This observation suggests incomplete mixing within the adult stock. Further genetic studies of population structure were encouraged.

A second factor which contributes to the large catch/biomass ratio is the use of spawning biomass as the measure of stock size. Young fish that are immature in February do not contribute to the spawning biomass estimate but may be captured by the fishery in late summer and autumn. The magnitude of this bias is not known but it probably has increased in recent years as young fish have become a larger fraction of the population and the landings. A

large fraction of the young fish that are captured in the trawl are mature; however, several researchers have noted that young fish are underrepresented in the trawl collections. If the underrepresented portion of the population has a high proportion of non-spawners then the true biomass is underestimated.

Age compositions for trawl surveys during 1978-82 were stratified into 4 regions and compared to the U.S. and Ensenada fisheries. The following patterns are apparent:

1. South inshore trawls have the highest relative abundance of young fish; north offshore and south offshore trawls have similar age compositions with few young fish.

2. In 1979 and 1980 the U.S. and Ensenada landings had similar age compositions; in 1978, 81 and 82 the U.S. fishery had more old fish.

3. The U.S. landings and north offshore trawls had similar age compositions.

4. The Ensenada landings were more similar to south inshore trawls than to south offshore trawls.

The 1980 egg production biomass estimate and the 1980 trawl age composition were used to estimate the abundance of each year class in spring 1980. The quarterly landings from the second quarter of 1980 through the fourth quarter of 1981 were used to calculate the virtual population of the 1977, 1978 and 1979 year classes in spring 1980 (assumed natural quarterly survival = 87%).

The ratios of virtual population/estimated abundance were 0.34, 0.84 and 1.46 for the 1977, 78, and 79 year classes. A value less than 1.0 is expected because the fishery does not account for all mortality. The large value for the 1979 year class is an underestimate because the year class continued to contribute a large fraction of the fishery after 1981. This result indicates that abundance of the 1979 year class was substantially underestimated when it was surveyed at 1 year old in 1980. The abundances of the older year classes seemed to be accurately estimated by the egg production method.

The consensus of the workshop was that estimates of spawning biomass are less than the total biomass available to the fishery. It was recommended that revision of the anchovy population model be delayed pending the results of further analyses of catch and age composition.

User Files Established for Coastwide Summary Data Base, 1974-1976

Under the direction of Program Leader Dr. Dan Huppert, the team of Cynthia Thomson, Industry Economist, Brian Edwards, Graduate Student Economist, and Richard Kiy, NOAA Junior Fellow, have been preparing a variety

of computer programs, auxiliary data files, and documentation for the coastwide Summary Data Base (CWSDB).

Thomson prepared a list of ex-vessel prices for each year by State (Washington, California, and Oregon) for each of the CWSDB species categories (7 salmon categories and 25 categories for groundfish, pelagics, crustaceans and mollusks). The task was complicated by the fact that standard sources (such as state publications and PMFC bulletins) did not cover prices during 1974-76, and NMFS publications used some categories that were incompatible with CWSDB categories.

Kiy produced a FORTRAN program that reads the annual summary file created by computer specialist Susan Iacometti and the price file created by Thomson to create a new summary file containing one record per fishing vessel. Each record contains (1) vessel ID, (2) nine binary variables indicating gear usage, (3) sixteen binary variables corresponding to areas of the coast, (4) total annual tonnage landed, (5) total ex-vessel value of landings, and (6) annual landings by species category. The program has been debugged and Kiy successfully created a new file for 1975 salmon-only vessels. During the next few weeks the group hopes to (1) complete the new summary files for non-salmon and combination vessels, (2) create analogous summaries for 1974 and 1976, and (3) augment the data records to include physical characteristics of vessels (length, tonnage, main engine horsepower).

System Design for PacFIN Research Data Base

Dr. Daniel Huppert, Program Leader, with the assistance of industry economist Cynthia Thomson and NOAA Jr. Fellow Richard Kiy, has completed a draft system design containing specifications for data input, description of activities, and summary data file outputs. This draft will be widely circulated and reviewed during August so that the Pacific Coast Fisheries Data Committee, meeting in San Francisco on September 1, can determine whether it should endorse the proposed system.

Oceanic Fisheries Resources Division

TUNA/BILLFISH RESOURCES PROGRAM

New Study on Genetic Variability in Tuna Stocks Initiated

Fishery biologist Dr. Andrew Dizon, and Dr. John Graves, NCR/NOAA Research Associate at the Southwest Fisheries Center (SWFC), report that the SWFC is beginning a study which will apply a new technique for measuring genetic variability to the old problem of defining the "unit stock" for population analysis and management needs. "The biological importance of the

stock concept as the management unit centers on the question of whether there is restriction of gene flow to a degree that effectively isolates the population units...and determines whether reproductive resistance to exploitation is a common property of the populations as a whole or of individual subpopulations [T.D. Iles & M. Sinclair, Science 215:627-633 (1982)]." Usually stocks of marine populations are identified by morphological, ecological, or biochemical characters. But many populations cannot be reliably subdivided using these techniques because the relative degree of differences between given stocks are such that huge numbers of samples are required.

Recently, a new technique has been developed which examines the genetic material (DNA) directly, unlike the previous techniques which examine the phenotypic expression of the DNA. This technique examines the similarity of the mitochondrial DNA (mtDNA) between individuals or populations. All metazoan animals have mtDNA of roughly similar size and information content; mtDNA amounts to less than 1% of the total nuclear DNA. The sequence of the 16,000 base pairs is maternally determined (the egg has all the mitochondria) and the mtDNA phenotype or pattern is transmitted intact between generations unaltered by recombination during sexual reproduction. All sequence changes in an individual's mtDNA arise by mutation which result in a new phenotype that can be unambiguously related to its progenitor. Since mutation rates of mtDNA can be estimated, determination of the numbers of mutations which relate the mtDNA sequences of individuals or groups allows the development of a time scale of divergence.

Sequencing of the mtDNA molecule first involves the isolation of the mitochondria from almost any tissue, and then the purification of the mtDNA. After purification, the circular mtDNA molecule is cleaved into various-sized fragments by restriction endonucleases. These enzymes consistently cut the mtDNA molecule at sites with a particular 4, 5, or 6 base pair sequence. The resultant fragment sizes are determined and, utilizing established algorithms, the number of base pair substitutions between individuals are calculated. The greater the number of substitutions, the more distant the relationship.

Currently, the Oceanic Fisheries Resources Division, with the considerable assistance of the Coastal Division, is preparing a laboratory for the mtDNA analysis. At this time most of the equipment and reagents for the isolation and purification of the mtDNA have been purchased. The initial goal of the laboratory will be to determine the best sample collection and handling techniques. If sufficient amounts of mtDNA can be obtained from frozen samples, a standard mitochondrial isolation and mtDNA purification process will be used. However, initial work by project collaborator, Dr. Stephen Ferris, Department of Biochemistry, University of California at Berkeley indicates poor mtDNA harvests from frozen skipjack tuna tissue. Thus, the SWFC study may have to employ a slightly different, more complex, technique which is, however, faster since the 24-40 hour ultracentrifugation step is eliminated. This technique can size mtDNA fragments in the presence of nuclear DNA and has proven useful on significantly degraded, mishandled, or frozen and thawed tissue samples. The technique also works with preserved whole blood samples such as those collected and stored from past subpopulation efforts.

The initial efforts of Dizon and Graves, in cooperation with Dr. Ferris, have been to employ the mtDNA technique on skipjack tuna captured off the coast of Brazil and off Hawaii. These two stocks have likely been isolated for the 3.1 million years since the uplift of the Panama land bridge, although a small amount of contact between the oceans may occur around Africa. So far, Dr. Ferris has found at least one difference between Atlantic and Pacific tuna. The fact that there is one difference shown even with the small sample of restriction enzymes employed (almost 50 restriction endonucleases are available and each cleaves the mtDNA molecule differently) is very encouraging. From the very few samples tested to date, it appears that the fish from the two oceans show about 0.3% sequence divergence (comparable to differences among human races). This is a small divergence considering the amount of time the two groups have been isolated by the Panama land bridge and suggests that there is or has been genetic interchange.

Preparations Made to Track Striped Marlin and Swordfish

During the second week of August through the end of September, fishery biologists Dave Holts, Dr. Andrew Dizon, Dr. Norm Bartoo, and James Squire will be deploying depth-sensitive ultrasonic transmitters on either striped marlin or broadbill swordfish. Their goal will be to study the vertical and horizontal movements of six fish and to attempt to correlate these movements with environmental parameters. An understanding of the movement patterns of these billfish will assist in resolving conflicts between sport and commercial fishermen. In addition, there is inherent scientific value in correlating the relationship of movement and resting with various environmental features and examining the effects of post-capture condition and survival after release.

Equipment is being readied for installation on the sportfishing boat, Marie B, a 36-foot, twin diesel vessel, owned by Richard Johnson. The tracking boat is being equipped with the ultrasonic receiver (32 kHz.) and the underwater directional hydrophone as well as an expendable bathythermograph (XBT). The latter instrument will enable correlation of depth of the fish with temperature.

Billfish Tagging Awards Given

The annual Gardiner Foundation Awards, given to the Mexican fishing captains who tagged and released the most billfish in 1981, were made in early July at Rancho Buena Vista, Baja California Sur, Mexico, by fishery biologist James Squire. The winner of the 1981 award, and past winner for many years, was Sr. Jesus Araiza Ruiz. Six awards were given consisting of cash and plaques engraved with the winner's name.

In addition to presenting the awards, Squire traveled to several of the fishing resorts which are cooperating with the tagging project. Tagging supplies for striped, blue and black marlin were replenished.

Stomach Contents of Western-Atlantic Skipjack Tuna Examined

As part of the U.S. commitment to the International Commission on the Conservation of Atlantic Tuna's (ICCAT) Skipjack Year Program, stomach contents from Western Atlantic skipjack tuna are being examined for forage items. Of particular importance is determination of the degree of cannibalism in the skipjack.

Biological technician Lisa Ankenbradt reports that 982 skipjack stomachs have been received. Over half (562) of the samples were collected in Puerto Rico from transshipment vessels between June 1981 and April 1982. Most of the remainder of the samples (400) were furnished by the Brazilian fishing agency SUDEPE, and were from fish caught in the Santos Basin between November 1981 and April 1982. During the next several months, she anticipates receiving approximately 500 more samples from Brazil. Both these and the Puerto Rican samples are products of the baitboat fishery in the southwestern Atlantic. An additional 20 samples were furnished by the Canadian government in January 1982 from seined skipjack tuna caught off the southeastern U.S.

To date, 370 stomachs have been examined: 129 from Puerto Rico, 200 from Brazil, and 20 from Canada. No juvenile skipjack tuna have been found in the stomachs; frigate mackerel, (Auxis thazard) and the chub mackerel, (Scomber japonicus) represent the predominant scombrid prey items.

MARINE MAMMAL BIOLOGY PROGRAM

Preliminary Data on Female Northern Offshore Spotted Dolphins Evaluated

Dr. Al Myrick, Leader of the Marine Mammal Age Determination Project, reports that frequency distributions by age class of about 775 randomly selected female northern offshore spotted dolphins show a dearth of specimens between 5 and 13 years of age for all years of kill (1973-1978). The frequency distributions were derived from age estimates made by zoologist Aleta Hohn, and Myrick. The implications of this frequency "depression" are unclear.

Growth rates were obtained by plotting body length against age. Figure 1 shows that the average length of a 1-year old is 125 centimeters (cm), 2-year olds average 145 cm, and 3-year olds, 155 cm. The asymptote or maximum size is approached at about the eighth or ninth year. Pooled estimates of "best age" indicate that some females may attain an age of 40 or more years. Sexual maturity, indicated by the presence of the first ovarian scar, occurs at approximately 10 years; the youngest pregnant female found was 10 years, the oldest, 32 years.

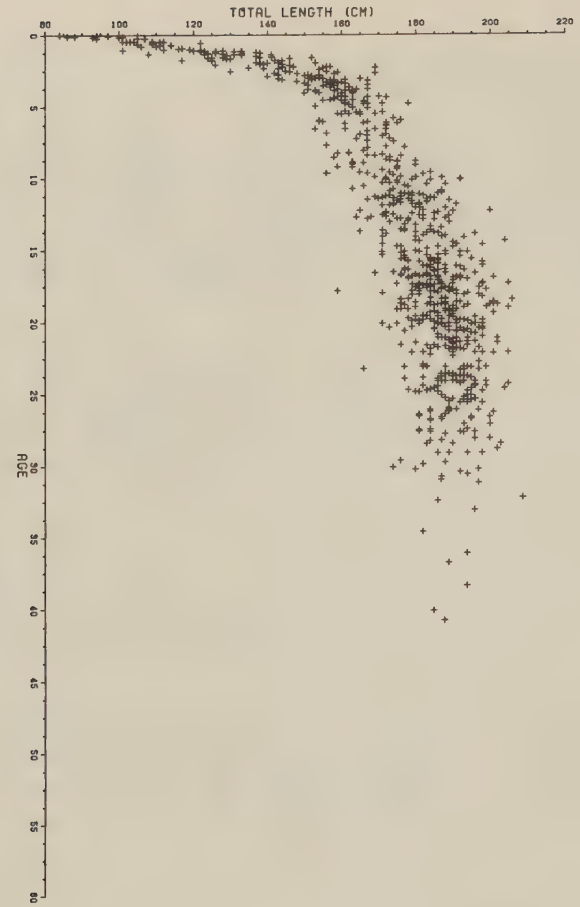


Figure 1: Growth plot of female northern offshore spotted dolphins.

Several meetings have been held between staff members of the Marine Mammal Biology and Stock Assessment Programs to consider questions regarding sample adequacy, sample enhancement methodology and the possible significance and bias of the preliminary data. This is critical since the data are to be used to update estimates of growth rates, age composition and age-specific reproductive rates for assessment of status of the stock.

Center Scientist Chairs International Whaling Commission Meeting

Dr. William Perrin, Leader of the Marine Mammal Biology Program, convened and chaired a meeting of the Subcommittee on Small Cetaceans of the International Whaling Commission's Scientific Committee in Cambridge, England, June 26 to July 8. Fishery biologist Dr. Tim Smith also participated in the meeting, along with scientists and observers from 17 nations: Australia, Brazil, Canada, Denmark, France, Iceland, Japan, the Netherlands, New Zealand, Norway, St. Lucia, the Seychelles, South Korea, Spain, the United Kingdom, the United States and the USSR.

The Subcommittee focused this year on review of stock assessments of exploited populations of pelagic dolphins, in particular the Black Sea population of the common dolphin (Delphinus delphis), the population of the striped dolphin (Stenella coeruleoalba) off Japan, and the eastern tropical Pacific populations of spotted dolphins (Stenella attenuata) and spinner dolphins (S. longirostris). Also treated in depth was the status of the population of Baird's beaked whales, Berardius bairdii, exploited by Japan in the western North Pacific.

After review of working papers and other material submitted, the participants prepared reports to the full Committee. The most important recommendations contained in the report called for:

--Provisional continuation of the beaked-whale fishery providing that research begin immediately to produce the information needed to determine the size and status of the stock(s) adequately.

--Initiation of direct efforts by the Commission to obtain better information from Turkey on the possibly severely depleted Black Sea populations of common dolphins (Delphinus delphis), bottlenose dolphins (Tursiops truncatus), and harbor porpoise (Phocoena phocoena).

--Research and reanalysis of catch and effort data for the Japanese striped dolphin fishery in order to allow meaningful interpretation.

--Participation by member nations in the Inter-American Tropical Tuna Commission's tuna/dolphin research.

--Reassignment of the status of populations involved in the eastern tropical Pacific tuna fishery.

The recommendations were endorsed by the full Committee and incorporated in the report submitted to the Commission at its annual meeting in July in Brighton, England.

Next year, the Subcommittee will concentrate on review of stock assessments for exploited phocoenid populations, in particular Dall's porpoise (Phocoenoides dalli) in the North Pacific; a review of scientific information on Cephalorhynchus spp.; and a review of live-capture fisheries.

Salvage Project Contributes to Center Research on Coastal Marine Mammal Populations

The Cooperative Marine Mammal Salvage Program (CMMSP) was formed in the fall of 1979 after a series of meetings with representatives of agencies involved in the recovery of stranded marine mammals along the San Diego County

coastline. As a result of these meetings, the Southwest Fisheries Center (SWFC) accepted the responsibility for recovery of dead stranded marine mammals and Sea World Inc., (SWI) accepted the responsibility for recovery of live stranded marine mammals. Several other agencies agreed to assist in the recoveries when the primary agencies (SWFC and SWI) were unavailable. All of the agencies agreed to collect a basic amount of data from each stranding and to disseminate it to interested individuals and organizations.

Marine mammal strandings are important to the marine mammal scientist for several reasons. First, and most important to the SWFC, is that the strandings can give an indication of the amount of human-related mortality, such as that caused by fishery interactions. The strandings also supply information on food habits, parasites, age of sexual maturity, reproductive rates, and sex- and age-specific mortality rates. The recovery of some specimens has extended known geographic ranges and added to the scant knowledge of rare species.

Since the inception of the CMMSP, the SWFC has recovered nearly 350 dead stranded marine mammals, of which about 90% were California sea lions (Zalophus californianus). The remaining 10% represented 3 other species of pinnipeds and 9 species of cetaceans. The cetaceans ranged in size from a 1-meter newborn bottlenose dolphin (Tursiops truncatus) calf to a 12.5-meter gray whale (Eschrichtius robustus).

The cause of death has been determined for approximately 30% of the animals. Most of these animals were California sea lions; the most common causes of death have been human-related, accounting for about 40% of the sea lions. Other known human-related mortality includes 2 whales, a minke (Balaenoptera acutorostrata) and a gray that had been involved in collisions with ships, and 2 pilot whales (Globicephala macrorhynchus) that were found with their flukes cut off, presumably while being removed from nets. Some specimens show evidence of previous encounters with humans, such as an old male bottlenose dolphin with a well-healed bullet wound from a .22 cal. weapon.

For California sea lions that died of human-related causes, 50% were gunshot victims; the other 50% had drowned. All but one were males. It is impossible to determine why the animals were shot, but there are several possibilities. For instance, these sea lions may have been killed for "sport," or while interfering with some fishing operations. The animals which drowned were all apparently normal, healthy specimens and are believed to have drowned in fishing nets. The California Department of Fish and Game has estimated that in 1981 about $450,000 worth of fish and fishing gear was lost to sea lions. They also estimated that about 1,900 sea lions are killed annually during fishing operations.

The large number of stranded California sea lions allows for some analysis of their mortality rates, including the seasonality of age- and sex-specific mortality rates. Figure 1 represents the strandings of sea lions by month, length, and sex for 1981 and clearly shows that both sexes have a high mortality of small animals (100cm-130cm) from May through June. These sea lions are yearlings, and this mortality is believed to be related to a high

incidence of lung worm (Parafilaroides decorus) infections. The strandings of larger animals occur at a relatively constant rate throughout the year, with a notable exception; during August and September there was an influx of adult males 205cm and above. This is just after the breeding season and these males may represent some of those that succumb to the stresses of the breeding season.

The minke whale that was struck by a ship proved to be a valuable specimen. It was the first minke whale ever recovered by the SWFC and is probably the only minke ever examined by scientific personnel in San Diego County. Minke whales occur in offshore waters throughout the world and can reach a length of about 10 meters. This minke was a male almost 8 meters long and could have been a sexually mature adult. It had been struck by the bow of a ship somewhere out at sea and carried into San Diego Bay by the vessel. After recovery, the skeleton of the whale was placed in the San Diego Natural History Museum; it is the only minke whale in the collection, aside from a small calf.

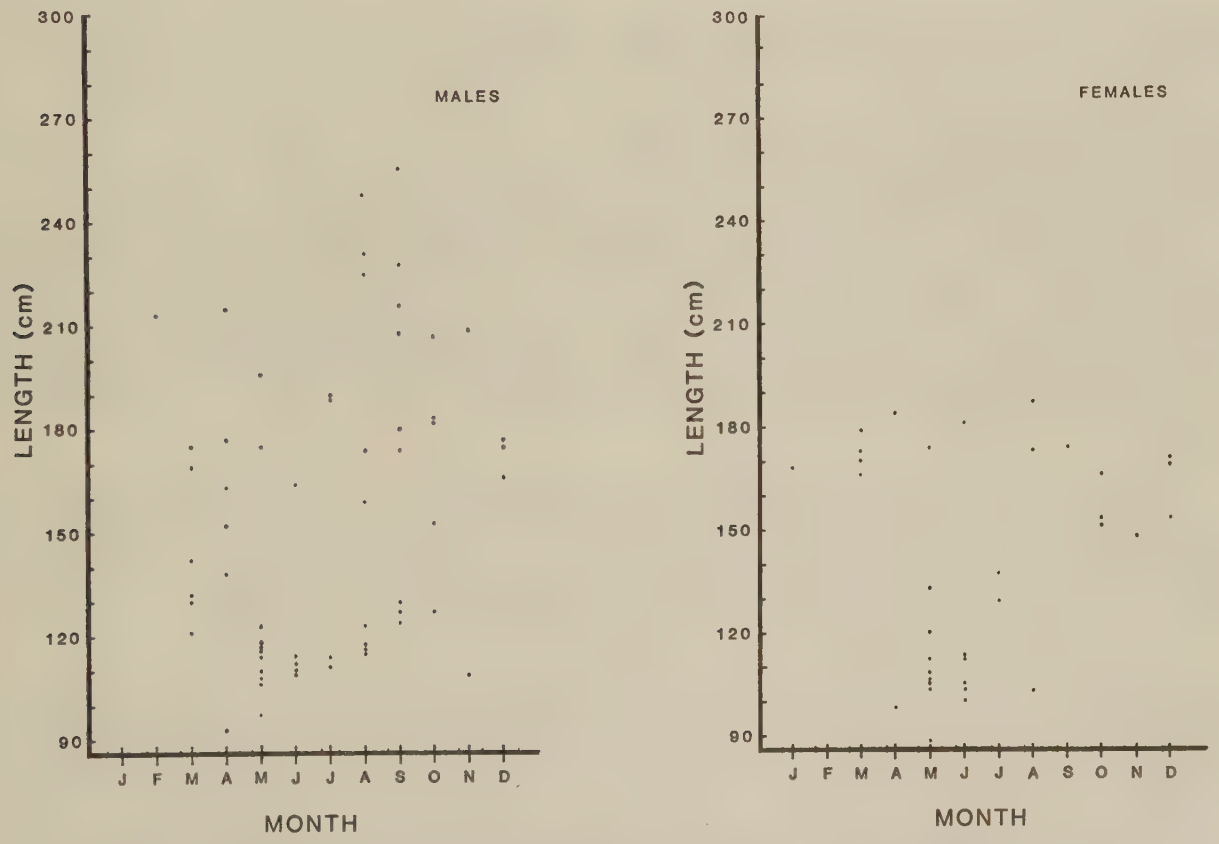


Figure 1: Standard length of stranded Zalophus californianus versus month of death, separated by sex. From specimens recovered from San Diego County, California, during 1981.

The SWFC has placed specimens in other institutions and has received specimens from CMMSP cooperators. Many important specimens and series have been placed in the Smithsonian Institution and other major museums which have

large collections of marine mammals, such as the Los Angeles County Museum of Natural History. The prepared material is then available for SWFC studies. The SWFC has received specimens from SWI and from the Naval Ocean Systems Center (NOSC), another cooperator. SWI collected a Dall's porpoise (Phocoenoides dalli) and a bottlenose dolphin; NOSC collected a striped dolphin (Stenella coeruleoalba) which is the only one from the temperate eastern Pacific in SWFC's collection.

By salvaging the stranded marine mammals from the beaches of San Diego County, the SWFC scientists are obtaining information valuable for understanding the population biology of marine mammals which occur off the southern California coast and are providing a service - removing dead and stranded animals from public beaches and waterways. The Program is an integral part of the SWFC's research on the population biology of California coastal marine mammals.

MARINE MAMMAL MONITORING AND ASSESSMENT PROGRAM

New Computer Program for Editing Dolphin Mortality Data Initiated

Since 1977 staff members of the Marine Mammal Monitoring and Assessment Program have produced biweekly estimates of dolphin mortality incidental to purse seine fishing for yellowfin tuna by U.S. registered vessels in the eastern tropical Pacific. Now, with a new computer program developed by EDS contract programmer Susan Boyer, under the direction of computer programmer analyst Ken Wallace of the La Jolla Laboratory, more accurate information on incidental kills can be produced.

Information on dolphin mortality is transmitted to the National Marine Fisheries Service, Southwest Regional Office (SWR) for monitoring of quotas for incidental kills by the U.S. fishery. The biweekly estimates are computed from kill data reported by scientific observers aboard a sample of the U.S. fleet, and from estimated days at sea for the entire U.S. fleet.

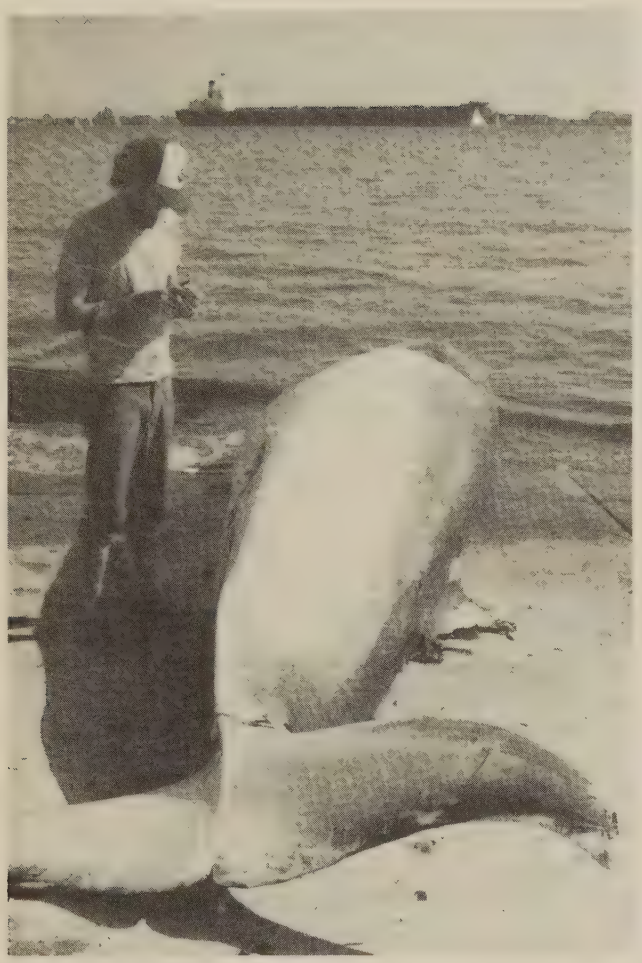
Dolphin kill data are collected from fishing trips that are randomly selected to carry a scientific observer. While at sea the observer collects a variety of data, including counts, by species and stock, of numbers of dolphin killed. The counts are recorded in observer logbooks. The observers are also required to make two reports via radio to a field office of the SWR. These radio reports, which include counts, by species and stock, of dolphins killed since the beginning of the trip, are received and stored in a computer base along with total days spent at sea by all vessels with completed and incompleted (still at sea) trips. This data base is used to produce the biweekly estimate of total kills.

When the observer completes his trip, his logbook data are immediately edited to correct errors and the corrected data are entered in a separate set log data base.

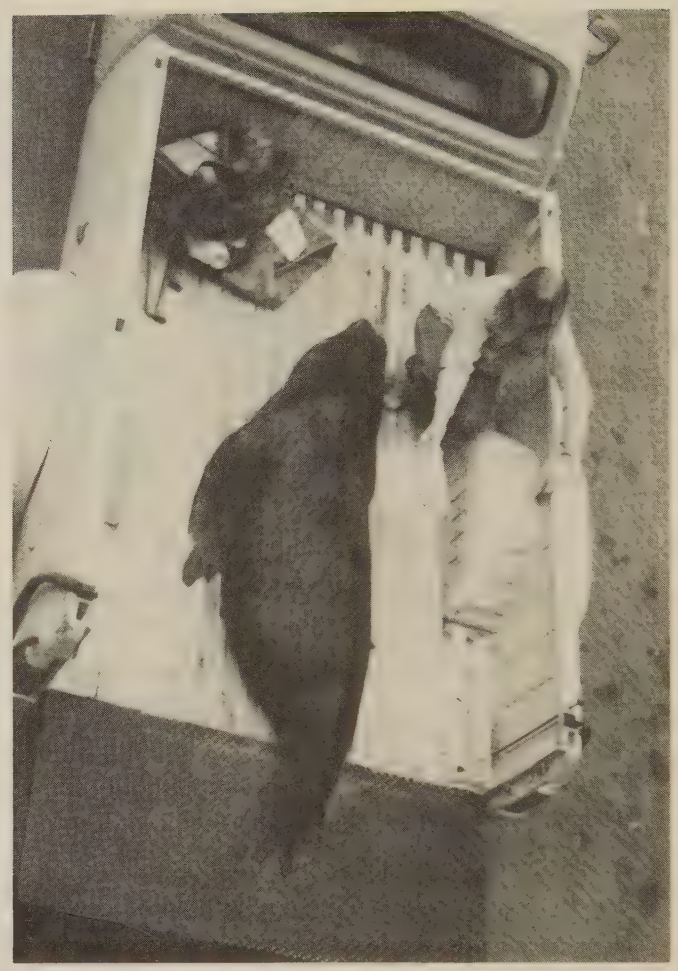
Boyer developed a computer program, TYRADEDIT, which compares the radio-report data base with identical trips in the set log data base. Discrepancies are identified and adjustments made to the radio-report data base so that a more accurate estimate of total kill can be made. The first test of TYRAEDIT was completed this month with 17 completed trips in the set log data base as of July 9. TYRAEDIT identified differences in the data base from 4 trips and made the following adjustments to the radio-report data base:

Trip	Northern Offshore Spotted	Eastern Spinner	Northern Whitebelly Spinner	Unident Spinner	Total
A	---	+10	-1	-9	0
B	---	+ 1	-2	+1	0
C	+ 1	---	---	---	+1
D	-10	+ 1	---	---	-9
Overall	- 9	+12	-3	-8	-8

Thus far in 1982, each animal in the radio-report data base represents 2 to 3 animals in the calculation of total kill. The corrections by TYRADEDIT have therefore had only negligible effect on the total kill estimates so far.



Larry Hansen, Biological Laboratory Technician, inspects the minke whale (Balaenoptera acutorostrata) that was killed in a collision with a ship.



Sandy Shay, contract worker for the MMSP, with a 4-5 year-old male California sea lion (Zalophus californiaus) salvaged from a local San Diego beach. The animal had died of a gunshot wound.

Minke whale, washed up on a beach near downtown San Diego.

TIBURON LABORATORY

FISHERIES DEVELOPMENT INVESTIGATION

Rock Crab Fishery Potential Investigated

As part of a continuing study to investigate the feasibility of a commercial rock crab fishery in northern California, NOAA Corps Lt. Pat Rutten, NOAA Jr. Fellow Frank Jacques, and commercial fisherman Darren Walton spent two days fishing for rock crab in Tomales Bay. Fishing was conducted on 20 and 21 July, utilizing ten ring nets and four southern California style plastic rock crab traps. Actual fishing time was 3 hours each day, which yielded 250 crabs weighing a total of 150 lb. The crabs were held at the Tiburon Laboratory and then transferred live to Golden Seas Fisheries in San Francisco for trial marketing. As time permits sampling will continue until fall.

Markets for Various Seafood Products Tested

This month members of the Fisheries Development Investigation group provided fish samples to a Los Angeles, California, processor to make processed food products for trial sales in specialized market areas. The trial sales are part of an ongoing effort by the Tiburon group to explore potential markets for new fishery products.

Octopus bimaculatus, the octopus commonly found in shallow water off southern California, was excellent in a Hawaiian dish called "poki," according to the processor. The octopus, which the Tiburon investigators obtained from a researcher from the California Department of Fish and Game, was uncooked. Unfortunately, the same dish cannot be made from the giant Pacific octopus (O. dofleini), which is available in much larger quantities, but a similar dish made with cooked octopus can use the larger species.

The whelk, Kelletia kelleti, was used as "tsukudani," a Japanese process which essentially preserves seafood by boiling it in soy sauce, ginger, and sugar. After being held a month in the refrigerator, the Kelletia tsukudani was still perfectly edible and quite tasty. The product is currently being test-marketed in Los Angeles' "Little Tokyo."

Shortbelly rockfish (Sebastes jordani) is apparently still being considered as a possible market item in Japan. One large Japanese firm recently requested through a domestic broker one container load of the fish for trial sale, presumably in Japan. Unfortunately, the Tiburon researchers were unable to provide the sample, and therefore directed the broker to possible suppliers in Monterey, California.

Requests were received from two fish brokers for samples of semi-dried sanddabs for market evaluation in Japan. Earlier tests with this product proved negative, but the brokers felt that the product was not of good quality. The Tiburon group thawed and dressed, (headed and gutted), 32 sanddabs taken during a recent cruise aboard the NOAA research vessel, David Starr Jordan. The fish had been kept in cold storage at -30°C and were in excellent condition. Processing consisted of soaking the cleaned fish in 100% brine for a half-hour, rinsing them, and drying them in a forced air dryer for 2-hours at a temperature of around 55°C. The processed fish were then refrozen and turned over to the brokerage firms. Many fishermen feel that substantial amounts of sanddabs can be caught during summer and fall, but present markets are small, and limited mainly to fresh fish. Tiburon investigators hope that markets for a dried or frozen product will increase the demand substantially.

Sorting Squid by Sex for Japanese Market Tested

Research on the economic feasability of sorting squid by sex and size for market continued this month at the Tiburon Laboratory. Prompted by the Japanese preference for female squid with eggs, the Fisheries Development Investigation staff sorted 3 samples of squid to find out if it is economically advantageous to package large female squid separately.

Sex ratio and size as a function of season may affect the desirability of sorting and separately packaging female squid. Because of the small number of samples, no trends in these factors are yet evident.

FISH COMMUNITIES INVESTIGATION

Weak Coastal Upwelling Affects Nearshore Fish Community

Investigation leader Dr. Edmund Hobson and fishery biologists Tony Chess and Dan Howard of the Predator/Prey Task examined the influence of an unusually weak upwelling along the coast of Mendocino, California. According to the researchers, the diminished impact of the normally dominant upwelling appears to have exerted some striking effects on interspecific relationships within the nearshore community.

The investigation was conducted early this month, when the nearshore waters were relatively warm and transparent and contained the variety of planktonic organisms characteristically associated with water from offshore.

Perhaps also related to this unseasonal water mass were large schools of juvenile shortbelly rockfish (Sebastes jordani), which usually are farther offshore, but this year were a major presence nearshore for the first time since Tiburon scientists began working at Mendocino in 1975. Significantly,

the major nearshore piscivorous predators there--the black rockfish (Sebastes melanops) and lingcod (Ophiodon elongatus)--have been gorged with juvenile shortbellies. These circumstances may also relate to the unusually large numbers of king salmon (Oncorhynchus tshawytscha) that have been close to shore this month. Fishery biologist Peter Adams of the Predator/Prey Task has found that king salmon usually prey heavily on juvenile shortbellies during early summer, but farther from shore than they have been feeding this month. Adams also noted that this year fewer king salmon have been present at the offshore fishing grounds near the Farallon Islands, though during the same period they have been abundant nearshore. In addition, the king salmon have switched their prey from juvenile shortbellies to anchovies earlier than usual.

Shortbelly Rockfish Research Nears Completion

The first draft of the manuscript describing diel feeding and prey of the shortbelly rockfish (Sebastes jordani) is being prepared by Tony Chess and Sue Smith, Fishery Biologists with the Predator/Prey Task. They also plan to present some of their preliminary results at this year's CalCOFI Conference in October 1982. The results indicate that from fall through spring, the shortbelly rockfish is a nocturnal, or possibly crepuscular predator that feeds predominantly on the euphausiid, Euphausia pacifica, with calanoid copepods (mainly Rhincalanus nasutus, Metridia pacifica and Calanus pacificus) augmenting the diet of younger fish during the day. In summer, however, the shortbelly appears to shift to a large degree to daytime feeding on the euphausiid, Thysanoessa spinifera, which occurs off the central California coast at this time in reproductive surface swarms. It is hoped that more can be learned about the summertime vertical distribution and diel movements on Thysanoessa spinifera during the upcoming Jordan cruise (27 August - 10 September).

FISHERIES INFORMATION SYSTEMS AND AUTOMATIC DATA PROCESSING

CALFIN and PACFIN Update--Regional and Coastwide Data Bases Being Developed

John Davies, Computer Specialist stationed at the Southwest Regional Office, is developing a Regional data base covering major species, fishing vessel profiles, and dealer information. At the same time a project has also been started at the Center with fisheries economist Dan Huppert to create a Coastwide data base.

Will Daspit of the Pacific Marine Fisheries Commission, Huppert, and Davies met at the Southwest Fisheries Center to develop a basic design of the Coastwide System. Some of the central ideas which emerged during the discussion were:

A) Because of State-Federal agreements there will be two data systems created. A northern data base consisting of data from Alaska, Washington and Oregon will reside on the Burroughs in Seattle. A southern data base consisting of data from Washington, Oregon and California will reside on the VAX in La Jolla.

B) The data base will consist of information about three basic areas: fishing vessel profiles, landings information and dealer profiles.

C) The source for vessel information will be the Fish and Game organizations of the four states. This information will be verified and enhanced by information from Coast Guard documentation files and NMFS interviews. The source for landings will also be the Fish and Game organizations of the four states. The vessel information on the landings data will be verified against the vessel file. The source for dealer information will be a combination of State Fish and Game and NMFS.

D) The development process would be to create the vessel file first since verification of landings is dependent on the existence of this file. It is hoped that the vessel file can be developed this summer so that work can be started on catch files this fall.

The next step in the process is for Huppert to send out a first draft of the system design for comments. Once this phase is completed, the group should be able to start creating the actual files.

Request to Extend Services Submitted

Dorothy Roll, Systems Analyst, reports that the FY82 award/contract with the University of California, San Diego and the University of Hawaii for computer services has the option to extend services from September 30, 1982 through June 30, 1983. The request to exercise this option without a change in the dollar limit has been sent to the Washington, D.C., fisheries headquarter for approval and processing by the NOAA Procurement Office.

ADP Equipment Funding Approval for SWFC

The ADP Policy Divisions of NOAA and Department of Commerce have approved the Southwest Fisheries Center's requests to procure ADP equipment with FY82 funds. The approval documents have been forwarded to the Northwest Administrative Services Office (NASO) in Seattle for procurement process. The approved items for the La Jolla Laboratory are a TAB System 700 key-to-disk entry machine which replaces the key-to-card unit, 10 Zenith cathode ray tube (CRT) terminals, 4 TAB 132/15 graphics terminal and 3 TAB 132/15 with graphics upgraded cabinet. The Televideo TS 806 is the micro-system approved for the Tiburon Laboratory. The procurement of a key-to-disk data entry system for the Honolulu Laboratory has been placed on open market bidding by NASO.

Prototype of Microcomputer System Configured

The protoype of the standard S100 bus microcomputer system for the La Jolla Laboratory has been configured by William Tester, the electronic engineer under contract to the Center. Robert Nydam, Computer Programmer Analyst, assisted Tester in the procurement of the components. The system consists of an Integrand 800-DB2F cabinet, a Heathkit-19 CRT, and an Epson 100 (300 baud) printer. The cabinet holds the power supply, a 2422 disk controller, a 2710A serial I/O card, a 2065 dynamic RAM module, a 2810 processor module and two 851 double density, double sided Shugart disk drives. A switchable 300-1200 baud modem has been interfaced to the micro-system for communication with UCSD's VAX and the ADP Network. The prototype is located in the ADP Operations office for on-hand testing and usage by the Center's staff.

Coastwide Data System Analyzed

Susan Iacometti, Computer Systems Programmer, is providing fisheries economist Dan Huppert, industry economist Dr. Sam Herrick, and mathematician Al Coan with technical assistance in the retrieval and analysis of the Coastwide Data System. The system contains vessel information and the 1974, 1975, and 1976 commercial landings for Washington, Oregon, and California.

* * * * * * * * * *

Iacometti is also in the process of transferring responsibility for the Aerial Marine Resources Monitoring System (AMRMS) to Cynthia Meyer, Computer Programmer in the Coastal Fisheries Resources Division of the La Jolla Laboratory.

Conversion of FRS Discussed

Robert Nydam, Computer Programmer Analyst, generated the two new Full-Time Equivalency (FTE) reports for the Financial Reporting System's (FRS) July summary reports. The reporting of the Data Management tasks was also separated from the support services tasks. Nydam and Dorothy Roll, Systems Analyst, met with Ben Remington, Executive Officer, to discuss conversion of the FRS from ADP Network Services to a time and cost-efficient system. The alternatives proposed are 1) the Center's standardized microcomputer be used for data entry/validation and transmission of data files to the UCSD's VAX DATATRIEVE system for queries and report generation, 2) a stand-alone microcomputer with 10 megabyte hard disk memory be dedicated to the FRS system, and 3) the implementation of alternative 1 with upgrade to alternative 2 at a later date.

MISCELLANEOUS

HONORS AND AWARDS

The Southwest Fisheries Center is establishing a record for quality of publications if the recent series of awards made by the NMFS Publications Advisory Committee are an indication.

This month, Dr. John R. Hunter, Fishery Biologist at the La Jolla Laboratory, was notified that the paper, "Spawning incidence and batch fecundity in northern anchovy, Engraulis mordax," which he co-authored with Dr. Steven Goldberg of Whittier College, has been awarded the NMFS outstanding Publication Award as the best publication appearing in a 1979 issue of the U.S. Fishery Bulletin.

Shown above (left), Dr. John Hunter receiving Certificate of Recognition from Dr. Izadore Barrett, Center Director, for his prize-winning paper (co-authored with Dr. Steve Goldberg). The Publications Advisory Committee also authorized a $300 award to Dr. Hunter.

At the Tiburon Laboratory, Peter Adams received similar recognition. His paper, "Life history patterns in marine fishes and their consequences for fisheries management," was awarded the NMFS Outstanding Publication Award as the best publication appearing in a 1980 issue of the U.S. Fishery Bulletin.

In letters to Hunter and Adams, William G. Gordon, Assistant Administrator for Fisheries, wrote, "Only effective and interpretive articles which significantly contributed to the understanding and knowledge of NMFS-mission related studies were eligible. (These papers) certainly met this requirement."

Dr. Roy Mendelssohn of the Pacific Environmental Group at Monterey, received the Committee's Honorable Mention Recognition for his paper "Using Markov decision models and related techniques for purposes other than simple optimization: Analyzing the consequences of policy alternatives on the management of salmon runs," which appeared in a 1980 issue of the U.S. Fishery Bulletin.

Honolulu Laboratory

Center Director Izadore Barrett presented length of service awards (20-year pin) to Thomas K. Kazama and Randolph K.C. Chang at a general staff meeting on July 14. Dr. Barrett also had service pins for Lucille Tsukano (20-year pin) and Tamio Otsu (35-year pin), who were not present.

PUBLIC AFFAIRS

Honolulu Laboratory

July 7 - T. Hida presented a slide show on research activities at the Honolulu Laboratory to the members of the Hui Holoholo Kai, a local recreational fishing club.

26 - R. Uchida of the Honolulu Laboratory participated in the Second Professional Maritime Conference which brought together educators and individuals in government and maritime interests for the purpose of directing the youth of Hawaii toward maritime careers. Uchida presented a brief review of the organizational structure of NOAA and of the career opportunities in the National Ocean Survey for maritime career-oriented youths, particularly those interested in the NOAA Corps.

La Jolla Laboratory

July 15 - Dr. Michael Laurs presented a talk to the Los Angeles Billfish Club on albacore research results.

21 - Dr. Tim Smith, Leader of the Marine Mammal Monitoring and Assessment Program, presented an invited lecture, "Porpoises, Tuna, and Computers" as part of a series of biology lectures on contemporary problems, with the overall subject, "Computers and the Life Sciences." This series of six weekly lectures, sponsored by the Department of Biology, at San Diego State University, dealt with the use of computers in biology teaching, data processing, physiological research, ecosystem modeling, and robotics, and was open to the public.

30 - A magnet school class combining students from the third to the sixth grade from Lowell Elementary School visited the SWFC accompanied by their teacher, Ms. Langham. Lillian Vlymen and Richard Kiy hosted the group which viewed a slide show on the Center and later toured the Center's research facilities.

Tiburon Laboratory

R. Bruce MacFarlane, oceanographer with the Physiological Ecology Investigation at the Tiburon Laboratory gave an invited presentation to the Striped Bass Task of the California State Water Resources Control Board in Sacramento, California on 26 July 1982. The talk concerned the contribution of pollutants to the qualitative and quantitative decline of the striped bass population of the San Francisco Bay-Delta system. Data were presented on tissue concentrations of petroleum hydrocarbons, trace metals, and chlorinated hydrocarbons; and parasite abundance and host reactions. Also presented was how these factors correlated with impaired physiological processes with emphasis on reductions in reproductive fitness. The Staff of the Striped Bass Task has been given the task by the Water Resources Control Board to document the status of the striped bass population, causes of the decline, and recommendations for remedial action.

PRESS RELEASES

Honolulu Laboratory

July 8 - "Japanese Fishery Scientists Participate in Cooperative Research Study."

13 - "Southwest Fisheries Center Handicapped Employee Excels in Field Athletics."

30 - "NOAA Vessel Completes Fishery Survey in the Mariana Archipelago."

La Jolla Laboratory

July 8 - "Students Win NOAA Junior Fellowships."

12 - "New Fishing Grounds Discovered off the Coast of Guam."

SEMINARS

La Jolla Laboratory

July 8 - Dr. John Hunter, SWFC, discussed, "Reproductive biology of clupeoid fish."

12 - Staff from the Office of Civil Rights, NOAA, Rockville, Maryland explained the new EEO counselor system. The realignment of the EEO counseling system will post counselors in eight major NOAA field locations.

13 - Holly Porter, Program Coordinator for the Mental Health Unit, Centre City Hospital, San Diego, presented a talk on "Our children are self-destructing."

15 - Larry J. Hansen, SWFC, lectured on "Pinnipeds of San Miguel Island."

21 - Roger Dickey, Program Coordinator of Centre City Hospital's Care Unit, San Diego, spoke on the subject, "America is drinking to forget."

TRAINING

La Jolla Laboratory

July 19-23 - Virginia Hostler - "Introduction to Supervision", Los Angeles, California.

MEETINGS AND TRAVEL

Honolulu Laboratory

July 12 - Richard S. Shomura, Laboratory Director, attended a meeting on fish aggregating devices called by University of Hawaii (UH) Sea Grant at the Marine Science Building on the UH campus.

19-21 - R. Uchida attended a conference, "Marine Mining: A New Beginning," at the Naniloa Surf Hotel, Hilo, Hawaii.

22 - R. Shomura and Uchida attended a meeting of the Coordinating Council on Research--NWHI in the Honolulu Laboratory conference room.

27-29 - R. Shomura and Dr. Jerry A. Wetherall traveled to California to attend the North Pacific albacore meeting at the SWFC.

28 - Dr. Skillman departed Honolulu for Noumea, New Caledonia, to attend the South Pacific Commission's 14th Technical Meeting on Fisheries.

La Jolla Laboratory

June 20-July 7 - Dr. Tim Smith traveled to Woods Hole, Massachusetts, and to England (London and Cambridge) to participate in the International Whaling Commission (IWC) Small Cetacean Subcommittee review of eastern tropical Pacific dolphins, and to study stock assessment methods of Black Sea dolphins.

June 22-July 17 - Dr. William Perrin traveled to Washington, D.C., to attend a meeting of the U.S. International Whaling Commission (IWC) delegation; to London, England to chair a meeting of the IWC Small Cetacean Subcommittee and to work with osteological material at the British Museum; and to Copenhagen, Denmark to work at the Royal Museum.

June 28-July 3 - Jim Squire traveled to La Paz, Mexico, to contact fleet operators about tagging striped marlin and shark, to present Gardiner Foundation Awards, and to contact fisheries respresentatives.

July 5-9 - David Mackett participated in a meeting held at the Center during the entire week devoted to an examination of current year operating plans. Also attending were Fred Beaudry of Fx5, Washington, D.C., Beverly Eggeman, South-

east Region, John Rittgers from the Northeast Region, and Dallas (Tex) Carlson, NASO, Seattle.

12-15 - Messrs. I. Barrett, J. Carr, and D. Mackett traveled to Honolulu, Hawaii to conduct Task Reviews and discuss FY 1983 budget plans with Director Shomura and staff.

15-22 - Dr. Gary Sakagawa traveled to Madrid, Spain to work with ICCAT Secretariat staff on plans for the upcoming Skipjack Conference scheduled for mid-June, 1983 in either Spain or the Canary Islands. Dr. Sakagawa is the convenor of the Skipjack Subcommittee.

16 - Fred Kellenberger was in Terminal Island to attend a FIN meeting with CF&G and SW Region staff.

16-19 - Chuck Oliver was on San Nicolas Island to meet with pinniped researchers and to establish the basis for joint studies at San Clemente Island.

17-20 - Fred Kellenberger traveled to Riverside, California to attend a teleconferencing workshop.

26 - Dr. Barrett, John Carr and David Mackett met informally with Dr. William Fox, Carmen Blondin and Richard Gutting and with Mr. Alan Ford and staff at the Southwest Region to review issues and concerns of importance to the Southwest.

- Dr. Sakagawa, Dr. DeMaster and Chuck Oliver represented the Southwest Fisheries Center at a meeting in Terminal Island with California Department of Fish and Game personnel. Present were Mel Odemar, Bill Maxwell, John Sholes, and Dan Miller, and their counterparts from the Southwest Region--Jim Lecky and Dana Seager. The group met to review procedures for transfer of management for coastal marine mammals to California.

29 - Robert Nydam, Susan Iacometti, and Dorothy Roll attended a computer exposition at the Los Angeles Convention Center.

- Dr. John Hunter met with Carl Nettleton, Executive Director of the National Coalition for Marine Conservation, Don Kent, mariculturist, Hubbs-Sea World Research Institute, Herb Frey, senior marine biologist, and Rob Collins, biologist, California Department of Fish and Game, on the possibilities for a white sea bass enhancement project.

Tiburon Laboratory

June 30-July 2 - Tina Echeverria traveled to Ft. Bragg and Eureka, California, to explain to port samplers and biologists a sampling efficiency experiment.

July 6-8 - Tina Echeverria traveled to Monterey and Morro Bay, to explain to port samplers and biologists a sampling efficiency experiment.

12-14 - Norman Abramson traveled to El Segundo, California, to attend the SSC meeting and then on to Long Beach, California, to meet with California Department of Fish and Game personnel.

20-21 - Edmund Hobson and Tony Chess traveled to Mendocino, California, to sample rockfish.

26-27 - Tina Echeverria traveled to Eureka and Ft. Bragg, California, to review progress of cost analysis project with participants.

27-30 - Bill Lenarz traveled to Seattle to attend a Groundfish Management Team meeting.

29-30 - Tina Echeverria traveled to Menlo Park and Morro Bay, California, to review the progress of the cost analysis project.

Pacific Environmental Group

July 19-20 - Ms. Donna Mallicoate traveled to San Diego to attend the LMR anchovy workshop.

21 - Dr. Douglas McLain traveled to San Francisco to meet with an official Chinese visitor to the NOAA IGOSS program.

22 - David Husby traveled to San Jose to evaluate different microcomputer systems.

26-30 - Dr. Richard Parrish traveled to La Jolla to work on the albacore model, attend the albacore steering Committee meeting and the Albacore Task Review.

VISITORS

Honolulu Laboratory

July 8 - Dr. Steve Reilly and Dr. Rennie Holt, La Jolla Laboratory, who were part of the scientific field party on the NOAA research vessel, David Starr Jordan visited R. Shomura.

9 - Charles J. Novosel, NMFS, NOAA, USDC Fisheries Inspector, Seattle, Washington, called on R. Shomura.

- Bruce L. Crumley, FMC Corps, Philadelphia, Pennsylvania, visited the Laboratory. Crumley was formerly a NOAA Corps Officer assigned to the Laboratory.

13-14 - Izadore Barrett, Director, SWFC, Deputy Director John Carr, and Planning Officer David Mackett conducted a Honolulu Laboratory program review.

13-19 - Robin Tuttle Waxman, Assistant to NMFS Director William Gordon, called on R. Shomura.

19 - Dr. Carol Hopper, Chaminade College, Honolulu, Hawaii, visited R. Shomura to discuss marine bioassay application to Ocean Thermal Energy Conversion.

21 - Dr. Pierre Kleiber, South Pacific Commission, Noumea, New Caledonia, and Dr. James B. Shaklee, Commonwealth Scientific and Industrial Research Organization, Cleveland, Queensland, Australia, visited R. Shomura.

23 - Crick Carleton, Nautilus Consultants of the United Kingdom, and George Kee, National Fishing Cooperation of Kiribati, met with S. Pooley to discuss bottom fish imports to Hawaii.

La Jolla Laboratory

July 1 - Ryoji Koseki, Chief, Bottom Fish Resources Section, Resources Division, Japan Fisheries Agency, Ministry of Agriculture, Forestry, and Fisheries, Japan.

July 7-August 12 - As part of the U.S.-U.S.S.R. Scientific Exchange Program, Soviet scientists Drs. Valery Mineev, Ministry of Fisheries, Moscow and Nikolay Doroshenko, TINRO, Vladivostok, arrived at the Center to take part in the cruise of the NOAA research vessel, Jordan, to assess distribution of cetaceans in the central and eastern Pacific.

July 12 - Jimmy Truesdale, Ruby Gross, and Bob Scruggs, NOAA/Office of Civil Rights, Washington, D.C.

July 19 - Dr. Eric Schneider, Environmental Protection Agency, on detail to NOAA to look at NOAA pollution/environmental programs. Dr. Schneider who was accompanied by Francesca Cava, NOAA Corps Officer, met with Director Barrett and staff.

Tiburon Laboratory

July 13 - George H.G. Eisenberg, Jr., Letterman Army Institute of Research, Presidio of San Francisco, California.

14 - James M. Lucas, Small Business Administration, San Francisco, California.

15 - Leo Kuntz, Oregon Trawl Commission, Gariboldai, Oregon.

20 - Dr. Eric Schneider and Francesca Cava, NOAA, Washington, D.C.

Pacific Environmental Group

July 16 - Dr. F. Chatelin, Mathematical Science Division of T.J. Watson Research Center, York Town Heights, New York.

20 - Dr. Dave Cutchins, Scripps Institution of Oceanography La Jolla, California.

21-23 - Professor R. Shumway, Division of Statistics, University of California at Davis, Davis, California.

29 - Dr. Curt Collins, National Science Foundation, Washington, D.C.

PERSONNEL ACTIONS

Honolulu Laboratory

July 9 - Gregory C. Luther, Biological Aid (Fisheries) - Termination-lack of work.

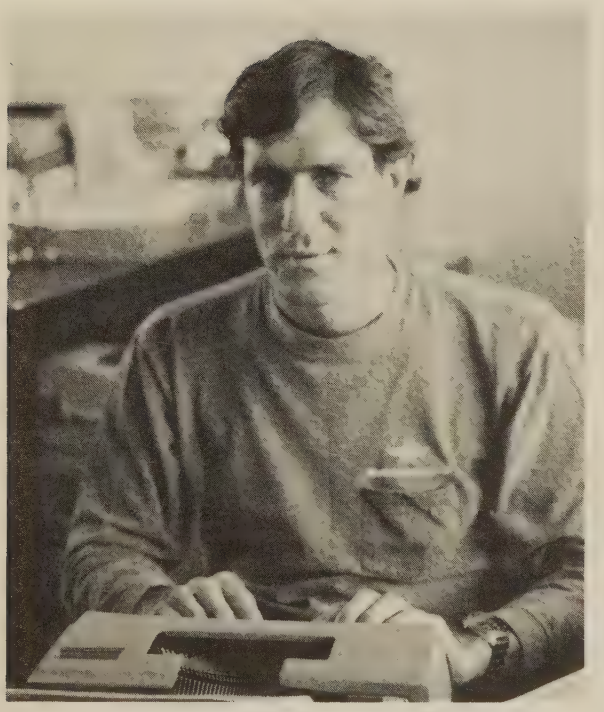
11 - Fletcher V. Riggs - Reassignment to Supervisory Computer Programmer Analyst.

16 - Mark A. Scheele, Computer Programmer - Resignation.

25 - James H. Prescott, Biological Technician (Fisheries) - Extension of Temporary Appointment.

26 - Louise F. Lembeck, Editorial Clerk - Full-Time, Temporary Appointment.

RECENT ADDITION TO THE HONOLULU LABORATORY STAFF



STEPHEN VAN DYKE RALSTON

Dr. Stephen Ralston joined the Honolulu Laboratory staff in May 1982 as a fishery biologist in the Resource Assessment Investigation of the Mariana Archipelago (RAIOMA) Task. Ralston earned his Bachelor's degree in Zoology at the University of California, Los Angeles, a Master's degree in Zoology from the University of Hawaii, and a Ph.D. in Fisheries Population Dynamics at the College of Fisheries, University of Washington in August 1981. Before joining the Honolulu staff, Dr. Ralston worked with the Hawaii Cooperative Fishery Research Unit, the Western Pacific Regional Fishery Management Council, and the Fishery Research Institute at the University of Washington.

La Jolla Laboratory

June 28 - Lorraine Zorich, Administrative Assistant - Termination.

- Martha Brown, Writer/Editor - Pay Adjustment to Full-Time.

July 10 - Daisy Gaston-Akinwanile, Budget and Accounting Clerk, Termination (Transfer).

12 - Lisa Ferm, Biological Technician - Change in Hours.

13 - Kate Coleman, Office Draftsman - Pay Adjustment to Full-Time.

16 - Daniel Fern, Computer Clerk - Resignation.

24 - Thomas Rider, Computer Clerk - Resignation.

26 - Alexander McConaughey-Stubbs, Economist - Change in Hours.

29 - Patricia Metcalf, Clerk-Typist - Entered on Duty.

La Jolla Laboratory Participates in College Upward Bound Program for 10th Year

The La Jolla Laboratory renewed its participation in the Harvey Mudd College Upward Bound Program, which assists low-income students and encourages them to pursue a college education. Many of the students in the program have come to the United States within the last 2 or 3 years.

Students from the program spent 4 hours each day in the work environment and 4 hours in academic classes conducted by the Upward Bound staff. The classes cover math, English, physiology, library sciences, and psychology.

This year three students spent 5 weeks at the Center assisting the research and administrative staffs:

- Josephine Hoang, an 18-year-old native of Laos, worked in the Fisheries Library and the Larval Fish Laboratory. (Supervisors: Mr. Dan Gittings, Dr. Geoff Moser, and Ms. Betsy Stevens).

- Phuoc Xuan Luu, 16, is a native of South Vietnam. He served as a biological assistant in the Food Products Laboratory. (Supervisors: Mr. Scott Miller, Mr. Eric Lynn).

- Nhi Muoi Pham, 17, is also a native of Vietnam. She assisted the staff of the Accounting Department this summer. (Supervisors: Ms. Daisy Gaston-Akinwanile, Mr. Ben Remington).

This is the 10th year that the La Jolla Laboratory has participated in the program.

Tiburon Laboratory

July 11 - Brian Jarvis, Biologial Technician - Promotion.

UNITED STATES
DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
8604 LA JOLLA SHORES DRIVE
P.O. BOX 271
LA JOLLA, CALIFORNIA 92038

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
DEPARTMENT OF COMMERCE
210

THIRD CLASS

DIRECTOR, HONOLULU LAB L15
F142, S.W. FISHERIES CENTER
NMFS, NOAA
P.O. BOX 3830
HONOLULU, HAWAII 96812